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REMARKS

The Examiner's action dated May 30, 2003, has been received, and its contents carefully noted.

Claim 1 has been amended to more clearly define the contribution of the invention over the prior art, and to include the subject matter of claims 3, 6 and 7, which have been cancelled, and claim 8 has been amended to depend only from claim 1. Thus, claims 1 and 8 are pending and claims 2-7 have been cancelled.

In response to the rejection of claim 6 under 35 U.S.C. 112, second paragraph, that claim has been cancelled and its subject matter has been incorporated into claim 1, in a form modified to respond to the formal rejection. Specifically, amended claim 1 now specifies that the iron core is longer than a combined length, in the moving direction, of the armature coils lying successively in the moving direction. It is submitted that this recitation clearly identifies the length dimension in question. It is therefore requested that this rejection be reconsidered and withdrawn.

All of the other rejection presented in the action are traversed for the reason that the present claims clearly distinguish patentably over any reasonable combination of the cited references.

Before discussing the rejections presented in the action, it would be helpful to review the primary features of the present invention.

First Feature

The moving-coil assembly is mounted on a table and includes several sets of three-phase armature coils and a core. The core is a flat iron member that extends lengthwise along the moving direction of the table and each of the coils is wound around the core. The coils are fixed on the iron core so as to lie sequentially in close juxtaposition with one another along the lengthwise direction or moving direction of the iron core, thereby providing armature coils of rectangular shape which are wound around the iron core of substantially rectangular shape in cross section in such a relation that the sides of the armature coils involved in thrust propulsion for the table are in a plane normal to the moving direction in opposition to the field magnets. With this construction, thus, the coil sides in the armature coils contributing to thrust production for the coil assembly get increased in number for each magnetic, compared with the prior art, making it possible to provide a slider unit extending largely in the moving direction even with high thrust propulsion.

Second feature

The dimension in the moving direction of the iron core is larger than the overall dimension of all juxtaposed armature coils and especially defined as the dimension equal to an integral multiple of one pole width plus one-half of a pole width. Moreover, any adjoining poles of field magnets are chamfered off at their corners coming into abutment against each other and facing the air gap. With this construction, the magnetic force exerted on the opposite fore-and-aft ends of the iron core can be made more uniform than in the prior art. This assures smooth movement of the coil assembly with the iron core, or the table on which the coil assembly is mounted.

Third feature

The magnet yoke is made in an integral construction in which confronting webs are joined along sides thereof, helping provide a slider unit that is light in weight, thin, and with a substantial length.

Turning now to the double patenting rejection presented on pages 3 and 4 of the action, claims 1-19 of U.S. Patent 6,348,746 (the '746 patent) are directed to a slider unit that has the following features:

- a moving coil assembly is mounted on a table that is made of an aluminum alloy;
- the moving-coil assembly is provided with armature coils constituted by a plurality of flat polyphase structures arranged on one surface of a coil board in juxtaposition along the moving direction of the table.

The slider unit defined in these claims does not include a number of limitations now contained in the claims of the present application. These limitations are also not disclosed in the specification of the '746 patent, which means that there would be no basis for "reading" those limitations into the claims of the patent. Specifically, claim 1 of the present application is directed to a slider unit having at least the following features not found in the claims of the '746 patent:

- any adjoining poles of field magnets are chamfered off at their corners coming into abutment against each other and facing the air gap;
- the moving-coil assembly is composed of an iron core of platy-configuration; and

-at least one set of 3-phase armature coils composed of three coils that are wound around the iron core in a direction intersecting the moving direction, and lying successively in the moving direction and secured to the iron core, whereby the iron core extends through the coils;

-the iron core is formed in a rectangular cross-section and made longer than a combined length, in the moving direction, of the armature coils lying successively in the moving direction;

-the iron core has a length, in the moving direction, substantially equal to the combined length, in the moving direction, of the armature coils plus one-half of a pole width.

Application claim 8 further specifies that the iron core is made of a lamination of thin steel sheets overlaid one on another. This limitation is also not found in the claims of the '746 patent.

Moreover, there would be no logical basis for modifying the structure claimed in the '746 patent on the basis of disclosures of the secondary references.

Higuchi is cited only for its disclosure of making a core from laminates. It is therefore understood that this reference is being relied upon only with respect to the limitation appearing in application claim 8. It must be pointed out, however, that the iron core defined in claim 8 has a rectangular configuration and cross-section, and this is not true of the iron core disclosed by Higuchi.

Wasson appears to be relied upon for its disclosure of a linear motor having 3-phase coils that are wound around a center pole in a direction intersecting the moving direction. In the embodiment illustrated in the drawing, the center pole is stationary and the coils are movable. In another embodiment, described in column 6, line 43-52, the center pole is attached to the coils and moves as a unit therewith. However, in this embodiment, the center pole extends from either side of the coils by at least a half-pitch. Specification, column 6, line 51. A half-pitch is equal to the width of one field magnet, or the width of one magnet pole. Specification, column 4, lines 13-16. Thus, in the embodiment disclosed by Wasson in which the center pole is attached to the coils, the center pole extends from either side of the coils by at least the width of one field magnet. In contrast, as defined in claim 1 of the present application, the length of the iron core in the moving direction is equal

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to the combined length, in the moving direction, of the armature coils plus one-half of a pole width.

It is submitted that there is no real basis for the conclusion that it would somehow be obvious to modify the slider unit defined in the claims of the '746 patent in accordance with the teaching of the secondary references, and particularly in accordance with the teachings of Wasson, because the arrangement disclosed by Wasson differs in kind from the coil arrangement defined in the claims of the '746 patent. One skilled in the art would understand from the claims in the '746 patent that substitution of the coil arrangement disclosed by Wasson for that defined in the '746 patent claims would be contrary to whatever is taught to those skilled in the art by those claims. This is all the more true since the claims of the '746 patent direct those skilled in the art away from the provision an iron core, in view of the recitation in patent claims 3 and 12.

Furthermore, even if one skilled in the art were to consider modifying the slider unit defined in the claims of the '746 patent in accordance with the teachings of the secondary references, the slider unit defined in claim 1 of the present application would not result because in such a modified unit, the iron core would not have a length, in the

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moving direction, substantially equal to the combined length, in the moving direction, of the armature coils plus one-half of a pole width.

Application claim 1 has been further amended to specify that adjoining poles of field magnets are chamfered off at their corners coming into abutment against each other and facing the air gap. The purpose of this chamfering is to make the magnetic force uniform at the four-and-aft ends of the iron core. With respect to this feature, which was originally recited in claim 7, the Examiner has relied on the references to Kawamichi and particularly to the arrangement shown on figure 3 thereof. According to the disclosure of that reference, there is provided a coil member 20 having coils arranged side by side in a flat orientation along the moving direction, without any associated iron core.

Kawamichi discloses that contact corners of adjacent magnets have chamfers in order to facilitate the flow of cooling air around the coil member. Thus, the reference provides chamfers for a reason entirely unrelated to that of the present invention. Moreover, because the coils of Kawamichi are not associated with an iron core and are not wound in the manner defined in claim 1 of the present application, the chamfers disclosed in that reference will

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perform an entirely different function than those according to the present invention.

Accordingly, it is submitted that the recitation in application claim 1 that adjoining poles of field magnets are chamfered off at their corners, in combination with the recitation of the coil assembly including an iron core and coils wound around the iron core in a direction intersecting the moving direction, further distinguishes over the prior art of record.

The rejection under 35 U.S.C. 103, based on Wavre in view of the secondary references discussed above is also traversed, for reasons similar to those set forth above. Reliance on Wavre appears to be based on the arrangement illustrated in figure 6 of that reference which shows a plurality of coils arranged side by side with coil axes perpendicular to the moving direction. These coils are disclosed as being mounted on a plate 14 made of a plastic material reinforced with carbon fibers. Specification column 6, lines 20-23. Thus, the coil arrangement disclosed in this reference is similar to that claimed, and disclosed, in the '746 patent.

In view of this similarity between Wavre and the subject matter claimed in the '746 patent, it is submitted

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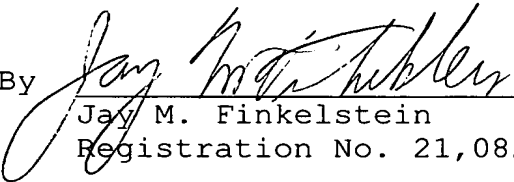
that claims 1 and 8 distinguish patentably over any combination of the references relied upon in support of the prior art rejections of claims 1, 3 and 6-8 in precisely the same manner as discussed above with references to the double patenting rejections.

Accordingly, it is requested that all of the rejections of record be reconsidered and withdrawn, that claims 1 and 8 be allowed and that the application be found in allowable condition.

If the above amendment should not now place the application in condition for allowance, the Examiner is invited to call undersigned counsel to resolve any remaining issues.

Respectfully submitted,

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